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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,667	11/29/2007	Gideon P. Stein	1300.0001	6672
75485 7590 03/30/2011 The Law Office of Michael E. Kondoudis 888 16th Street, N.W. Suite 800 Washington, DC 20006				
EXAMINER				
PERUNGAVOOR, SATHYANARAYA V				
ART UNIT		PAPER NUMBER		
2624				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

rlynn@mekiplaw.com
elee@mekiplaw.com

Office Action Summary

Application No.

10/599,667

Applicant(s)

STEIN ET AL.

Examiner

SATH V. PERUNGAVOOR

Art Unit

2624

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/20/07
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Oath/Declaration

[1] The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

[2] The oath or declaration is defective because: the oath filed on 12/4/2007 fails to claim priority to the PCT/IL 2005/000063 and incorrectly claims priority to an unrelated application 10/952,832.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[3] Claims 1-7, 11, 13, 14, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. ("Stein") [WO 01/39018 A1] in view of Ohmamyuda et al. ("Ohmamyuda") [US 5,502,432].

Regarding claim 1, Stein discloses the following claim limitations:

A method of estimating a time-to-collision (TTC) of a vehicle with an object
[abstract] comprising the step of: (a) acquiring a plurality of images (*i.e.* Ψ and Ψ') of
the object at known time intervals (*i.e.* ΔT) between the times at which the images of

the plurality of images are acquired [page 6, para. 2]; and (b) determining the time-to-collision ("TTC") (*i.e. time to contact*) solely from information derived from the images (*i.e. S*) and the time intervals (*i.e. ΔT*), wherein said determining the TTC is based on a relative velocity (*i.e. relative speed*) ~~and relative acceleration~~ between the vehicle and the object [pages 6-8].

Stein does not explicitly disclose the following claim limitations (emphasis added):

Determining the TTC is based on a relative velocity and relative acceleration between the vehicle and the object.

However, in the same field of endeavor Ohmamyuda discloses the deficient claim limitations, as follows:

Determining the TTC is based on a relative velocity (*i.e. V_r*) and relative acceleration (*i.e. G*) between the vehicle and the object [col. 4, ll. 10-20]

Stein and Ohmamyuda are combinable because they are from the same field of collision warning.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Stein with Ohmamyuda and include relative acceleration when calculating the time of collision, the motivation being to consider activities such as braking which alter time of collision calculation based on relative velocity [col. 4, ll. 60-61].

Regarding claim 2, Stein meets the claim limitations, as follows:

The method according to claim 1, further comprising the step of: (c) determining the relative velocity from the images (*i.e. relative speed* = $\Delta Z / \Delta T$) and using the relative

velocity to determine TTC (*i.e. deriving eq. 16 based on the relative speed eq. 13*) [pages 7 and 8].

Regarding claim 3, Stein meets the claim limitations, as follows:

The method according to claim 1, wherein said (b) determining the time-to-collision (TTC) includes determining a change in scale of an image of at least a portion of the object (*i.e. S*) and using the change in scale (*i.e. S*) for determining a function (*i.e. eq. 16*) of the relative velocity (*i.e. relative speed*) [pages 7 and 8].

Regarding claim 4, Ohmamyuda meets the claim limitations, as follows:

The method, according to claim 1, further comprising the step of: (c) determining a function of the relative acceleration from the images (*i.e. G*) and using said function of the relative acceleration to determine the TTC (*i.e. Ta*) [col. 4, ll. 10-20; col. 5, ll. 1-10].

Regarding claim 5, Ohmamyuda meets the claim limitations, as follows:

The method according to claim 4, wherein said (c) determining said function of the relative acceleration (*i.e. G*) includes determining a time derivative of a function of the relative velocity (*i.e. eq. 2*) [col. 5, ll. 10].

Regarding claim 6, Stein meets the claim limitations, as follows:

The method according to claim 3, wherein said determining a change in scale includes determining a ratio (*i.e. Y_1/Y_2*) between a dimension of the object in a first

one of the images and the same dimension of the object in a second one of the images [page 7].

Regarding claim 7, Stein meets the claim limitations, as follows:

The method according to claim 6, wherein said determining a function of the relative velocity includes determining a function $T_v = [1 / (S-1)] \Delta T$ where S is the ratio and ΔT is a time lapse between two images of the images (i.e. eq. 16) [page 8].

Regarding claim 11, Stein meets the claim limitations, as follows:

The method according to claim 1, further comprising the step of: (c) determining whether the vehicle and the object are on a course that leads to a collision at the TTC (i.e. determining whether there is a positive non-infinite time to collision) [page 8].

Regarding claim 13, Stein meets the claim limitations, as follows:

A system which performs the method steps of claim 1, for determining the time-to-collision (TTC) of the vehicle with the object, the system comprising: (a) at least one camera mounted in the vehicle and adapted for said acquiring of the images (i.e. camera 13) [page 2]; and (b) a processor (i.e. processor 14) which determines the time-to-collision (TTC) solely from information derived from the images and the time intervals, based on the relative velocity and the relative acceleration between the vehicle and the object (i.e. see discussion for claim 1) [page 2].

Regarding claim 14, Stein meets the claim limitations, as follows:

The system, according to claim 13 wherein the at least one camera is a single camera
(*i.e. camera 13*) [page 2].

Regarding claim 15, Ohmamyuda meets the claim limitations, as follows:

The system, according to claim 13, further comprising:(c) an alarm apparatus for
alerting a driver of the vehicle to a possible collision with the object responsive to
the TTC [col. 5, ll. 39-43].

Regarding claim 17, Stein meets the claim limitations, as follows:

The system, according to claim 13, wherein the at least one camera images an
environment in front of the vehicle [fig. 1].

[4] Claims 16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. ("Stein") [WO 01/39018 A1] in view of Ohmamyuda et al. ("Ohmamyuda") [US 5,502,432] further in view of Lemelson et al. ("Lemelson") [US 2004/0022416 A1].

Regarding claims 16, 18 and 19, Stein and Ohmamyuda meet the claim limitations as set forth in claim 13.

Stein and Ohmamyuda do not explicitly disclose the following claim limitations:

16. The system, according to claim 13, further comprising:(c) an alarm apparatus
which alerts, based on the TTC, at least one person outside of the vehicle to a
possible collision of the vehicle with the object.

18. The system, according to claim 13, wherein the at least one camera images an environment in back of the vehicle.

19. The system, according to claim 13, wherein the at least one camera images an environment to a side of the vehicle.

However, in the same field of endeavor Lemelson discloses the deficient claim limitations, as follows:

16. The system, according to claim 13, further comprising: (c) an alarm apparatus which alerts at least one person outside of the vehicle to a possible collision of the vehicle with the object (*i.e. warning the drivers of other vehicles*) [para. 0099].

18. The system, according to claim 13, wherein the at least one camera images an environment in back of the vehicle [para. 0045].

19. The system, according to claim 13, wherein the at least one camera images an environment to a side of the vehicle [para. 0045].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Stein and Ohmamyuda with Lemelson and employ multiple cameras and provide external alarm signals, the reasoning being that collision can occur due to fault of other vehicles, so monitoring and providing alarms to other drivers avoids such collisions.

[5] Claims 12 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. ("Stein") [WO 01/39018 A1] in view of Ohmamyuda et al. ("Ohmamyuda") [US 5,502,432] further in view of Narayan et al. ("Narayan") [US 6,317,691 B1].

Regarding claim 12, Stein and Ohmamyuda meet the claim limitations as follows:

A method according to claim 11, wherein said determining whether the vehicle and object are on a course that leads to a collision at the TTC includes: (ii) determining whether at TTC features straddle at least a part of the vehicle (*i.e. when $Z=0$*) [*Stein: pages 7-8*].

Stein and Ohmamyuda do not explicitly disclose the following claim limitations:

- (i) determining respective motions of at least two features of the object relative to the vehicle from the images.

However, in the same field of endeavor Narayan discloses the deficient claim limitations, as follows:

- (i) determining respective motions of at least two features of the object relative to the vehicle from the images (*i.e. detecting the distance between the vehicles based on the variations (motion) in the apparent distances between the two taillights*) [*col. 6*].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Stein and Ohmamyuda with Narayan and track taillights to determine distances between the vehicles, the reasoning being avoid the need for a range finder.

Regarding claims 20-24, all claimed limitations are set forth and rejected as per discussion for claims 1-7, 11-15 and 17.

Allowable Subject Matter

[6] Claims 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

[7] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Sath V. Perungavoor whose telephone number is (571) 272-7455. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Matthew C. Bella whose telephone number is (571) 272-7778, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dated: March 25, 2011

/Sath V. Perungavoor/

Sath V. Perungavoor
Primary Examiner, Art Unit 2624
Telephone: (571) 272-7455